REGULATION III – CONTROL OF AIR CONTAMINANTS

RULE 337
GRAPHIC ARTS

INDEX

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SECTION 100 – GENERAL

101 **PURPOSE:** To limit the emissions of volatile organic compounds to the ambient air stemming from the use of inks, coatings, adhesives, fountain solutions, and cleaning materials used in ~~from~~ graphic arts ~~and associated coating processes~~ operations.

102 **APPLICABILITY:** This rule applies to any graphic arts printing operation and to the use of organic solvents used for cleaning, storage, and disposal associated with such operations in Maricopa County.

103 **EXEMPTIONS:** This rule shall not apply to the following types of graphic arts facility operations:

103.1 Circuitry printing and other associated printing performed for labeling, logo, or identification purposes on a printed circuit, its substrate, its immediate covering, or its immediate encapsulant by a circuitry printer; or

103.2 Any printing operation which employs a combination of printing presses with a maximum of 500 square inches (3226 cm^2) of impression area and a maximum of two units per printing press. For the purposes of this rule, "units" means the number of printing surfaces.

104 **PARTIAL EXEMPTIONS:** This rule shall not apply to the graphic arts facility operations which are listed below:

104.1 A graphic arts facility is excluded from Section 301 of this rule if the facility emits less than 25 tons VOC (22,680 kg) per calendar year and 4200 pounds (1909 kg) per any month of VOC from all operations prior to control.

104.2 Any facility that becomes subject to the provisions of Section 301 by exceeding threshold amounts described in Section 104.1 of this rule will remain subject to these provisions even if annual emissions later fall below these thresholds, except as otherwise directed by an air pollution permit.

SECTION 200 – DEFINITIONS: See Rule 100 (General Provisions and Definitions) for definitions of terms that may be used in this rule but are not specific to this rule. For the purpose of this rule, the following definitions shall apply:

201 **ADHESIVE –** Materials that are applied for the primary purpose of bonding two surfaces together by surface attachments. Adhesives may be used to facilitate the attachment of two surfaces or substances in varying degrees of permanence.

~~201~~ 202 **ALCOHOL –** A volatile organic compound – such as isopropanol, normal-propanol, and ethanol – of alkane structure consisting of fewer than 6 carbon atoms and having a single OH- (hydroxyl) group and no other non-alkane attachments.

~~202~~ 203 **ALCOHOL SUBSTITUTE –** A wetting agent, used to replace some or all of the alcohol in fountain solutions, and usually containing inorganic phosphates and volatile organic compounds such as glycols.

~~203~~ 204 **CIRCUITRY PRINTING –** Any graphic arts operation which either uses ink(s) with specific electrical properties to print an electrical circuit, or prints a circuit pattern that is made into an electrical circuit through further processing.

~~204~~ 205 **CLEANING SOLUTION –** Any liquid, including blanket wash and roller wash, used to remove ink and debris from the operating surfaces of a printing press or from any of the attached parts of a press.

~~205~~ 206 **COATING -** A layer of material applied to a substrate in a relatively unbroken film.

~~206~~ 207 **EMISSION CONTROL SYSTEM (ECS) –** A system for reducing emissions of organic compounds, consisting of both collection and control devices which are approved in writing by the Control Officer and are designed and operated in accordance with good engineering practice.

~~207~~ 208 **FLEXOGRAPHIC PRINTING –** The application of words, designs or pictures by roll-printing technique in which the image-carrying surface is raised above the surface of the printing roll and the image carrier is made of flexible rubber or other elastomeric material.

209 **FOUNTAIN SOLUTION –** A mixture of water and other volatile and non-volatile chemicals and additives that maintains the quality of the printing plate and reduces the surface tension of the water so that it spreads easily across the printing plate surface. The fountain solution wets the non-image area so that the ink is maintained within the image areas. Non-volatile additives include mineral salts and hydrophilic gums. Alcohol and alcohol substitutes are the most common VOC additives used to reduce the surface tension of the fountain solution.

~~208~~ 210 **GRAPHIC ARTS –** All screen, gravure, letterpress, flexographic and lithographic printing processes, including related coating and laminating processes.

~~209~~ 211 **GRAPHIC ARTS FACILITY –** All the graphic arts processes and activities which are located on one or more contiguous or adjacent properties and are under the control of the same person (or persons under common control).

~~210~~ 212 **GRAPHIC ARTS MATERIAL –** Any ink, varnish, coating or adhesive, including added thinner or retarder, used in printing or related coating or laminating processes.

~~211~~ 213 **GRAPHIC ARTS VARNISH –** A transparent material, applied by printing press, that is used to adjust gloss, to adjust color, or to protect printed material or printing substrate.

~~212~~ 214 **GRAVURE PRINTING –** An intaglio process in which the ink is carried in minute, etched or engraved wells on a roll or cylinder, excess ink being removed from the surface by a doctor blade.

215 **HEATSET –** A lithographic printing process where the printing inks are set by the evaporation of the ink oils in a heatset dryer.

~~213~~ 216 **LAMINATION –** A process of fusing two or more layers of material together to form a single sheet by using adhesive.

~~214~~ 217 **LETTERPRESS PRINTING –** A method in which the image area is raised relative to the non-image area and the ink is transferred to the paper directly from the image surface.

~~215~~ 218 **LITHOGRAPHIC PRINTING –** A printing process where the image and non-image areas of the printing plate are chemically differentiated; the image area is oil receptive and the non-image area is water receptive. This method differs from other printing methods, where the image is on a raised or recessed surface.

219 **MAINTENANCE CLEANING –** A solvent cleaning operation or activity carried out to keep tool, machinery, equipment (excluding ink, coating, or adhesive application equipment) of general work areas in clean and good operational condition.

220 **NON-HEATSET –** A lithographic printing process where the printing inks are set without the use of heat absorption and/or oxidation of the ink. For the purposes of this rule, use of an infrared heater or printing conducted using ultraviolet-cured or electron beam-cured inks is considered non-heatset.

~~216~~ **221** **NON-PRECURSOR ORGANIC COMPOUND** – ~~Any of the organic~~ Organic compounds ~~listed~~ referenced in subsection a. of Appendix A, which have been designated by the EPA as having negligible photochemical reactivity are listed in Rule 100 (General Provisions and Definitions).

222 **OFFSET LITHOGRAPHIC PRINTING** –A plane-o-graphic method in which the image and non-image areas are on the same plane and the ink is offset from a plate to a rubber blanket, and then from the blanket to the substrate.

223 **OVERALL EFFICIENCY** – The efficiency of an emission control system measured by the emissions collection system efficiency multiplied by the destruction efficiency of the control device divided by one hundred.

~~217~~ **224** **PRINTING –** An operation that imparts color, design, pattern, alphabet or numerals onto a substrate. It differs from coating in that its principal intent is to accomplish such visual/spatial outcome(s) rather than for other purposes commonly accomplished by using coatings.

~~218~~ **225** **PRINTING INK –** A fluid or viscous formulation used in printing, impressing or transferring an image onto a substrate.

~~219~~ **226** **SCREEN PRINTING –** A process of passing printing ink through a screen (a taut web or fabric) to make an imprint on a substrate. A refined form of stencil has been applied to the screen such that the stencil openings determine the form and dimensions of the imprint.

227 **SHEET-FED –** A lithographic printing process where individuals sheets of substrate are fed to the press sequentially.

228 **SOLVENT –** Organic compounds that are used as a diluents, thinners, dissolvers, viscosity reducers, cleaning agents or used for a similar purpose.

229 **ULTRAVIOLET (UV) INK –** An ink which dries by polymerization reaction by ultraviolet or electron beam radiation.

~~220~~ **230** **UNITS PER PRINTING PRESS –** The number of printing surfaces per printing press.

~~221~~ **231** **VAPOR PRESSURE –** The pressure exerted at a uniform temperature by the gas of a substance when the gas is in equilibrium with the liquid (or solid) phase of that substance. Example: At 68°F the vapor pressure of toluene vapor in equilibrium with undiluted liquid toluene is 23 millimeters of mercury.

~~222~~ **232** **VOC VAPOR PRESSURE –** The total vapor pressure exerted by VOC at an even temperature. It distinguishes the vapor pressure of VOC from the vapor pressures of other fluids when a liquid contains both VOC and non-VOC fluids.

~~223~~ ~~**VOLATILE ORGANIC COMPOUND (VOC)** – Any organic compound which participates in atmospheric photochemical reactions, except a non-precursor organic compound.~~

~~224~~ **233** **WEB-FEED –** An automatic system which supplies substrate from a continuous roll or from a continuous extrusion process.

SECTION 300 – STANDARDS

301 ~~**GRAPHIC ARTS MATERIALS**~~ **LIMITATIONS:** VOC emissions from graphic arts ~~materials~~ operations shall be limited as follows:

301.1 **Limits of VOC Content**: An owner/operator of a graphic arts facility ~~No person~~ shall not apply any inks, varnishes, coatings, or adhesives unless the VOC content as applied is equal to or less than ~~2.5 pounds per gallon (300 grams per liter), less water and non-precursor organic compounds.~~ the following limits set forth in Table 1:

TABLE 1

EFFECTIVE - 12 months after rule is adopted

GRAPHIC ARTS MATERIAL	Current VOC CONTENT LIMIT less water and non-precursor organic compounds lbs./gal. - (g/ l)	Effective 00/00/10 VOC CONTENT LIMIT lbs./gal. - (g/ l)
Ink	2.5 (300)	-
Flexographic Ink Pourous Substrate	2.5 (300)	1.9 (225)
Flexographic Ink Non-Pourous Substrate	2.5 (300)	-
Coating	2.5 (300)	-
Adhesive	2.5 (300)	1.25(150)

301.2 **Add-On Controls**: **Emission Control System for Heatset Offset Lithographic Printing and Heatset Letterpress Printing:** As an alternative to the provisions of subsection 301.1, ~~a person~~ an owner/operator of a graphic arts facility may comply by using an Emission Control System (ECS) that maintains a 90% by weight control efficiency for VOC emissions from the dryer exhaust vent. New installations of an ECS shall reduce ~~with a control device efficiency which reduces~~ the VOC emissions from the dryer exhaust vent by at least ~~90~~ 95 percent by weight (effective the date of adoption of this rule). The dryer pressure shall be maintained at negative pressure relative to the surrounding ~~lower than the~~ press room air pressure such that air flows into the dryer at all times when the press is operating.

301.3 **Add-On Controls**: **Emission Control System for All Other Graphic Arts Printing**: As an alternative to the provisions of subsection 301.1, ~~a person~~ an owner/operator of a graphic arts facility may comply by using an Emission Control System (ECS) which reduces the VOC emissions from the dryer exhaust vent by at least ~~90~~ 95 percent by weight, and has an overall capture and control efficiency of at least ~~65~~ 80 percent by weight.~~effective as of the date of adoption of this rule.~~ An owner/operator of a graphic arts facility which has an existing ECS shall comply with this standard effective on (insert date of 12 months after rule adoption). Existing ECS shall comply with the increments of progress towards this standard as listed in Section 400 of this rule.

302 **FOUNTAIN SOLUTION VOC LIMITS:** ~~After March 27, 1997, an~~ An owner ~~or~~/operator of an offset lithographic printing press shall limit the combined total volume of alcohol, ~~alcohol substitute,~~ and any other VOC in each fountain solution source listed in Table 2 to the following as applicable ~~limits in column A of Table I,~~ whenever the press is on. ~~;except that a~~

302.1 Column A: General limits for a fountain solution;

302.2 Column B: Limits for a fountain solution source that is refrigerated below 60°F and ~~having~~ has a properly indicating temperature monitor; ~~is subject to the limits in column B of Table I.~~

302.3 Column C: Limits for the combined total volume of VOC in a fountain solution that contains no alcohol.

~~TABLE 1~~
~~HEATSET WEB OFFSET LITHOGRAPHIC PRINTING~~
~~VOC LIMITS BY VOLUME FOR FOUNTAIN SOLUTION *~~

~~Column A~~	~~Column B~~ ~~Limit for a Source Refrigerated~~	~~Column C~~ ~~No Alcohol in Solution~~
~~General Limit~~	~~Below 60°F (15.5˚C)~~	
~~15 percent~~	~~25.5 percent~~	~~March 28, 1997~~
~~10 percent~~	~~17 percent~~	~~March 28, 1998~~
~~5 percent~~	~~8.5 percent~~	~~March 28, 1999~~

TABLE 2
VOC LIMITS BY WEIGHT FOR FOUNTAIN SOLUTIONS

	Column A	**Column B**	**Column C**
	General Limit	**Limit for a Source Refrigerated Below 60□F (15.5˚C)**	**No Alcohol in Solution**
Heatset Web Offset Lithographic Printing	Current 5.0 % Effective XX/XX/XX 1.6 %	Current 8.5 % Effective XX/XX/XX 3.0%	5%
Sheet-Fed Offset Lithographic Printing	5%	8.5%	5%
Cold-Set Web Offset Lithographic Printing	-	-	5%

*(Appendix A Table AP-I gives equivalent limits)

303 CLEANING SOLUTIONS: ~~Any person~~ An owner/operator ~~who owns or operates~~ of an offset lithographic printing press or letterpress press shall reduce VOC emissions from cleaning solutions by using cleaning solutions with a VOC vapor pressure less than 10 mm Hg at 20°C. ~~compliant with the standards in Table 2. In addition, all VOC-containing materials used for the cleaning and cleanup, including rags and towels, shall be stored in closed containers when not in use.~~

~~TABLE 2~~
~~VOC-VAPOR-PRESSURE LIMITS FOR CLEANING SOLUTIONS~~

~~Vapor Pressure~~	~~Compliance Date~~
~~33 mm Hg~~	~~March 28, 1997~~
~~25 mm Hg~~	~~March 28, 1998~~
~~10 mm Hg~~	~~March 28, 1999~~

304 WORK PRACTICES: An owner/operator shall apply the following work practice to the use, handling, mixing, storage, or disposal of VOC containing materials in any graphic arts facility:

304.1 EQUIPMENT CLEANUP:

a. The cleaning solutions and shop towels are collected in a container which is closed when not in use such that volatile organic compounds are not emitted into the atmosphere; or

b. The equipment is disassembled and cleaned in a solvent vat which is closed when not in use, or cleaning is done by other methods, approved in writing by the Control Officer, which limit evaporation.

304.2 **VOC CONTAINMENT AND DISPOSAL:** An owner/operator shall apply the following work practices to store, discard, or dispose of VOC or VOC-containing material including used solvents and shop towels to prevent evaporation. These practices include but are not limited to the following:

a. All materials from which VOC can evaporate, including fresh solvent, waste solvent, used applicators, solvent-soaked rags and residues, shall be stored in closed containers when not in use; and

b. Waste solvents, and their residues, shall be stored in closed, leakfree containers which are legibly labeled with their contents and which remain covered when not in use.

c. Records of the disposal/recovery of such materials shall be kept.

304.3 **CONTAINER LABELING:** Containers with VOCs shall be legibly labeled with their contents.

~~**304**~~ **305** **LABELING REQUIREMENT:** No person shall sell, offer for sale, or manufacture for sale within Maricopa County any ink, coating, adhesive, fountain solution or fountain solution concentrate for use in graphic arts operations unless such material includes a designation of VOC content on data sheet(s), expressed in pounds per gallon or grams per liter.

~~**305** **OPERATION AND MAINTENANCE (O&M) PLAN:** The owners or operators of an emission control system used to meet the requirements of this rule shall provide the Control Officer with an O&M Plan. This plan shall specify key system operating parameters, such as temperatures, pressures and/or flow rates, necessary to determine compliance with this rule, and describe in detail procedures to maintain the emission control system. The Control Officer's written approval of this plan and the implementation of this plan shall be required for compliance with this section to be achieved.~~

306 **AIR POLLUTION CONTROL EQUIPMENT AND APPROVED EMISSION CONTROL SYSTEM (ECS)**: An owner /operator of a facility shall provide, properly install and maintain in calibration, in good working order, and in operation, air pollution control equipment required by this rule. Regardless, any air pollution control equipment that is installed must achieve the applicable standard(s) required by this rule, as determined by the corresponding test method(s), as applicable, and must achieve other applicable standard(s) set forth in this rule.

306.1 **Operation and Maintenance (O&M) Plan Requirements for ECS:**

a. An owner /operator of a facility shall provide and maintain, readily available on-site at all times, (an) O&M Plan(s) for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or to an air pollution control permit.

b. **Providing and Maintaining ECS:** An owner /operator shall submit for the ~~The~~ Control Officer's written approval ~~of this~~ an O & M plan for each ECS monitoring device that is used pursuant to this rule. ~~and the implementation of this plan shall be required for compliance with this section to be achieved.~~ The following shall be included in such plans:

(1) Procedures for collecting and recording required data in a form approved by the Control Officer;

(2) Procedures and schedules for installation, calibration and corrective maintenance performed for the purpose of maintaining the emission control system in proper operating condition.

306.2 O & M Plan Responsibility:

a. Initial Plans: An owner /operator that is required to have an O&M Plan pursuant to this rule shall comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified by the Control Officer in writing. Once the initial plan has been approved in writing by the Control Officer, an owner or operator shall then comply with the approved plan.

b. Revisions to Plan: If revisions to the initial plan have been approved by the Control Officer in writing, an owner/operator shall comply with the revisions to the initial plan. If revisions to the plan have not yet been approved by the Control Officer, then an owner or operator shall comply with the newest recent O&M plan on file at Maricopa County Air Quality Department.

c. Control Officer Modifications to Plan: After discussion with the owner/ operator, the Control Officer may modify the plan in writing prior to approval of the initial O & M plan. An owner or operator shall then comply with the plan that has been modified by the Control Officer.

~~**306 EXEMPTIONS:**~~

~~**306.1 Exemption From Section 301:** The provisions of Section 301 of this rule shall not apply to any graphic arts facility which emits less than the threshold amounts of 25 tons (22,680 kg) per calendar year and 4200 pounds (1909 kg) per month of VOC from all graphic arts and related coating operations prior to control. Except as otherwise directed by air pollution permit, any facility that becomes subject to the provisions of Section 301 by exceeding either threshold amount will remain subject to these provisions even if annual emissions later fall below these thresholds.~~

~~**306.2 Total Exemption:**~~

~~**a.** Circuitry printing is exempt from this rule. This exemption includes other associated printing performed for labeling, logo, or identification purposes on a printed circuit, its substrate, its immediate covering, or its immediate encapsulant by a circuitry printer.~~

~~b. Any printing operation in which no printing press has over two units, and the combined impression area of all presses together does not exceed 500 square inches (3226 cm2) is exempt from this rule.~~

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

401 ~~**EFFECTIVE DATE:** This rule is effective May 3, 1996~~. **COMPLIANCE SCHEDULE**: An owner/operator who chooses to comply with the new emission limits found in Section 301.1 of this rule by installing an ECS or is required to increase the efficiency of the ECS under Section 301.3 of this rule shall meet the following milestones:

401.1 Submit a compliance plan, by (3 months after rule adoption), to the Control Officer for approval which describes the method(s) used to achieve full compliance with the rule. This plan shall specify dates for completing increments of progress, such as the contractual arrival date of new control equipment. The Control Officer may require an owner/operator submitting the compliance plan to also submit subsequent reports on progress in achieving compliance; and

401.2 Attain full compliance with all of the standards in this rule by (12 months after rule adoption).

SECTION 500 – MONITORING AND RECORDS

~~**501** **PROVIDING AND MAINTAINING MONITORING DEVICES:** Any person operating an Emission Control System pursuant to this rule shall install, maintain, and calibrate monitoring devices described in an O&M Plan. The monitoring devices shall measure temperatures, pressures, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly.~~

~~**502** **MONITORING FOUNTAIN SOLUTION CONTAINING ALCOHOL:** The owner or operator of any printing press shall monitor the alcohol concentration of each fountain solution source containing any alcohol with a refractometer, a hydrometer or a conductivity meter. The instrument shall have a visual readout (analog or digital) with an accuracy of either ± 2 percent of the meter's full scale, or ± 0.5 percent absolute (such as for meter readings given in percent.)~~

~~**502.1** **Weekly Entry of Monitoring Data If Any Alcohol Is Used:**~~

~~**a.** A weekly entry shall be made of the results of an instrument reading, required by Section 502, for each fountain solution source containing any alcohol; and~~

~~**b.** Weekly, for each fountain solution source, record the names and the most current mixing ratio of all alcohol, alcohol substitutes, and water used in making fountain solution in that source.~~

~~**502.2** **Monthly Entries for Presses Which Never Use Any Alcohol:** Monthly, record the names of all alcohol substitutes and the mixing ratio of all alcohol substitutes to water, for each fountain solution source on a press which never uses alcohol.~~

~~**503** **RECORDKEEPING AND REPORTING:** Any person subject to this rule shall comply with the following requirements. Any records required by this rule shall be retained for five years and shall be made available to the Control Officer upon request.~~

~~**503.1** **Current List:** Maintain a current list of inks, coatings, adhesives, fountain-solution alcohol(s) and alcohol substitutes, thinners, cleaners, and any other VOC-containing materials used at the facility; state the VOC content of each in pounds per gallon or grams per liter. In addition, for each blanket wash and other cleaning solution, list the VOC vapor pressure at 20°C (68°F).~~

~~**503.2** **Usage Records of Graphic Arts Materials and Cleaning Solutions:** In compliance with the schedule in subsections 503.2 a. and 503.2 b. below, update records showing the type, and amount of each graphic arts ink, varnish, coating, adhesive, fountain solution, blanket wash, and all other cleaning solutions.~~

~~**a.** Daily Records for 25 Ton Sources: Daily, an operator of a graphic arts facility shall update usage records of materials specified in subsection 503.2 if, facility-wide, such facility emits 25 tons or more of VOC emissions per calendar year or 4200 pounds or more of VOC emissions per month from all graphic arts and related coating operations prior to any control. However, the operator may maintain *monthly* records of materials complying with subsection 301.1 VOC Limits or Section 303 vapor pressure limits, if each material served by a control device is identified as such.~~

~~**b.** Monthly Usage Records: Monthly records of materials' usage shall be maintained pursuant to subsection 503.2 by any facility except for the (≥25 TPY) facilities subject to subsection 503.2 a.~~

~~**503.3** **ECS Operation and Maintenance:** Maintain a continuous record of the times an Emission Control Device is used to comply with this rule. Maintain daily records of the O&M Plan's key system operating parameters. Maintain records of all maintenance performed according to the O&M Plan.~~

501 **RECORDKEEPING AND REPORTING** An owner/operator subject to this rule shall comply with the requirements set forth in this section. All records and data required by this section shall be kept on site for a period of 5 years in a consistent and complete manner and be made available without delay to the Control Officer or his designee upon request. Records kept in either in electronic or paper copies are acceptable. Records shall consist of the following information:

501.1 **Current List of Materials:** Maintain a current list of process materials including at a minimum:

a. **Name:** The name of inks, coatings, adhesives, fountain-solution alcohol(s) and alcohol substitutes, thinners, cleaning solutions, and any other VOC-containing materials used in the graphic arts processes; and

b. **VOC Content:** The VOC content of each material should be listed as pounds of VOC per gallon or grams of VOC per liter; and

c. **Vapor Pressure:** In addition, for each blanket wash and other cleaning solution, list the VOC vapor pressure (VP) at 20°C (68°F). Any one of the following ways of providing the VP data is sufficient:

(1) A current manufacturer's technical data sheet; or

(2) A current manufacturer's safety data sheet (MSDS); or

(3) Actual test results; or

(4) A letter signed by an official or lab manager of the supplying facility.

501.2 **Frequency of Recordkeeping:** Update records showing the type and amount of each graphic arts ink, varnish, coating, adhesive, fountain solution, blanket wash, and all other cleaning solutions for a facility which emits the following, prior to controls:

a. **Daily:** 25 tons or more of VOC per calendar year or 4200 pounds or more per month from all graphic arts and related coating operations shall maintain daily records as described in Section 501.1 of this rule.

b. **Monthly:**

(1) 25 tons or more of VOC per calendar year may maintain monthly records of materials complying with subsection 301.1 Limits of VOC Content, Section 302 Fountain Solution VOC limits, or Section 303 vapor pressure limits, if each material served by a control device is identified in the manner described in Section 501.1 of this rule:

(2) Less than 25 tons per calendar year and subject to subsection 104.1 shall maintain monthly records of materials' usage pursuant to subsection 501.1.

501.3 **Fountain Solutions Containing Alcohol:** Monitor the alcohol concentration of each fountain solution source containing any alcohol with a refractometer, a hydrometer or a conductivity meter. The instrument shall have a visual readout (analog or digital) with an

accuracy of either + or – 2 percent of the meter's full scale, or + or – 0.5 percent absolute (such as for meter readings given in percent.)

a. A weekly entry shall be made from the results of the instrument reading for each fountain solution source containing any alcohol; and

b. For each fountain solution source, record the names and the most current mixing ratio of all alcohol, alcohol-substitutes, and water used in making fountain solutions in that source.

501.4 Fountain Solutions That Do Not Contain Alcohol: Record the names of all alcohol-substitutes and the mixing ratio of all alcohol-substitutes to water, for each fountain solution source on a press which never uses alcohol on a monthly basis.

502 ECS Recording Requirements: On each day an Emission Control System is used at a facility an owner/operator of the facility shall document the installation, maintenance, and calibration of ECS monitoring devices described in an O&M Plan in the following manner:

502.1 Make a permanent record of the operating parameters of the key systems as required by the O&M Plan; and

502.2 Make a permanent record of the maintenance actions taken, within 24 hours of the action's completion, for each day or period in which the O&M Plan requires that maintenance be done; and

502.3 Enter an explanation for scheduled maintenance that is not performed during the period designated for it in the O&M Plan.

~~504~~ 503 COMPLIANCE DETERMINATION – TEST METHODS
The EPA test methods as they exist in the Code of Federal Regulations (CFR) as listed below, are incorporated by reference in Appendix G of the Maricopa County Air Pollution Control Regulations. Copies of test methods referenced in this Section are available at the Maricopa County Air Quality Department, 1001 N. Central Avenue, Suite 595, Phoenix, AZ 85004-1942. An exceedance of the limits established in this rule determined by any of the applicable test methods constitutes a violation.

~~504.1~~ 503.1 Sample Analysis:

a. VOC content of graphic arts materials regulated by Section 301 or Section 302 shall be determined using the applicable EPA Reference Method 24 or 24A, Title 40, CFR, Part 60, Appendix A. The ASTM method D6419 (Standard Test Method for Volatile Content of Sheet-Fed and Coldset Web Offset Printing Inks) replaces ASTM D2369 which is referenced in EPA Method 24.

b. Calculation of the VOC content of fountain solutions (reference Section 302) shall place the entire volume of the sample in the denominator, e.g., including water, alcohol, non-precursors, and all other solutes, such that the entire volume of the sample is included in the calculations.

~~504.2~~ 503.2 Test Method For Determining Minimum VOC Content Of A Fountain Solution Via Density And Specific Gravity: The test method procedure, which employs an ASTM-rated hydrometer, is found in this rule's Appendix A, subsection ~~b~~ a. ~~ASTM is the American Society for Testing and Materials.~~

~~504.3~~ 503.3 Emission Testing: Control efficiency of an emissions control device shall be determined according to EPA Reference Method ~~25,~~ 25A, or 25B, Title 40, CFR Part 60, Appendix A. Capture efficiency of an Emissions Control System shall be determined according to

"Guidelines for Determining Capture Efficiency" January 9, 1995, Candace Sorrell, Source Categorization Group A, Office of Air Quality Planning and Standards, US EPA. This document is incorporated by reference and is available at ~~2406 South 24 Street, Suite E-214,~~ the Maricopa County Air Quality Department, 1001 N. Central Avenue, Suite 595, Phoenix, AZ 85004 or call (602)-506- ~~6700~~ 6710 for information.

~~504.4~~ **503.4** **Vapor Pressure:** The total partial vapor pressure of all VOC in a cleaning solution shall be determined by ~~ASTM D2879-92~~ ASTM D2879-97 or by calculations using certified data from a laboratory or manufacturer revealing the exact formulation.

APPENDIX A TO RULE 337

~~a. **Definition. NON-PRECURSOR ORGANIC COMPOUND** – Any of the following organic~~ Organic ~~compounds which have been designated by the EPA as having negligible photochemical reactivity: acetone; methane; ethane; methylene; chloride (dichloromethane); 1,1,1-trichloroethane; trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (CFC-22); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); 1,2-dichlorotetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); trifluoromethane (HFC-23); 2,2-dichloro-1,1,1-trifluoroethane (HCFC-123); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); 1,1-dichloro-1-fluoroethane (HCFC-141b); 1-chloro-1,1-difluoroethane (HCFC-142b); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane (HFC-134); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1,1-trifluoroethane (HFC-143a); 1,1-difluoroethane (HFC-152a); parachlorobenzotrifluoride (PCBTF); perchloroethylene (tetrachloroethylene); 3,3-dichloro-1,1,1,2,2pentafluoropropane (HCFC-225ca); 1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb); 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee); cyclic, branched, or linear completely methylated siloxanes; all completely fluorinated, completely saturated: alkanes, ethers and tertiary amines; sulfur-containing perfluorocarbons with no unsaturations, no hydrogen, and with sulfur bonds only to carbon and fluorine.~~

a. Test Method for Determining the Density and Specific Gravity of a Fountain Solution:

(1) Procedure: Gently invert or shake a covered container of fluid to be tested several times to assure adequate mixing. No foam should be present where hydrometers are inserted. Readings should be taken as quickly as is practicable to avoid unnecessary evaporation of VOC content. Conduct 6 successive readings with 2 different hydrometers, 3 readings apiece. Each hydrometer shall be accurate within 2 percent of full scale and conform to ASTM requirements. A thermometer, accurate to ±0.5°F and conforming to ASTM requirements, shall be used and the temperature of the fountain solution being tested shall be noted. The thermometer may be an integral part of a combined form hydrometer. The density of water at that temperature shall be obtained from a standard table such as is found in the CRC reference.

(2) Findings: The quotient of the density of the fluid divided by the density of water shall be determined for each of the 6 pairs of numbers. If none of the 6 results equals or exceeds (is larger than) the applicable specific gravity limit in Table AP-1, then the percent of VOC in the tested fountain solution exceeds the limit. In other words, it is not a violation of the limit unless each of the total of six results is below the limit.

b. Equivalent Expressions of VOC Limit:

Table AP-I*

VOC LIMIT (by volume)	Limit: Maximum pounds of VOC per gallon of fountain solution	Limit: Metric equivalent	Specific Gravity of IPA & water at VOC volume limit
~~15%~~	~~1.1 lb/gal~~	~~130 g/liter~~	~~0.9800~~
~~10%~~	~~0.75 lb/gal~~	~~90 g/liter~~	~~0.9860~~
5%	0.43 lb/gal	52 g/liter	0.9920
1.6%	0.11 lb/gal	13 g/liter	0.9980
3.0%	0.20 lb/gal	24 g/liter	0.9976
~~25.5%~~	~~1.75 lb/gal~~	~~210 g/liter~~	~~0.9690~~
~~17%~~	~~1.16 lb/gal~~	~~140 g/liter~~	~~0.9790~~
8.5%	0.58 lb/gal	70 g/liter	0.9890

*(This table references Table ~~1~~ 2, Section ~~302~~ 301.2)